

Advanced Fire Detector for Space Applications, Phase II

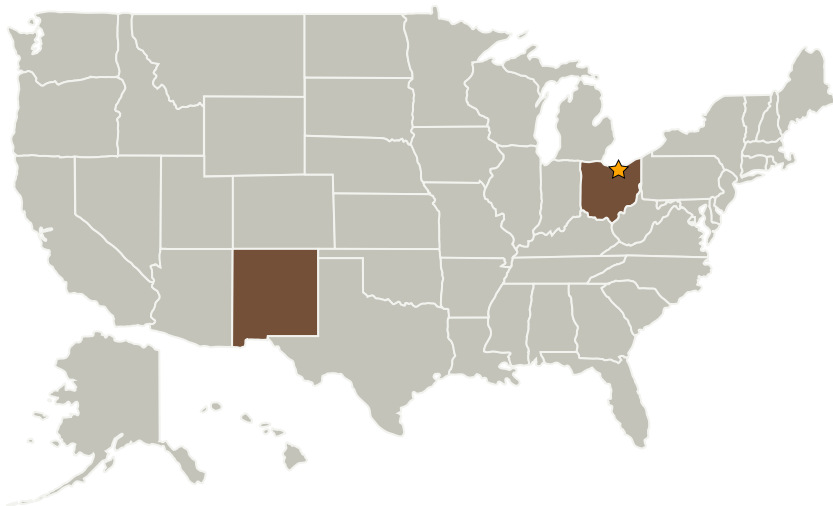
Completed Technology Project (2009 - 2011)



Project Introduction

New sensor technology is required to face the challenging tasks associated with future space exploration involving missions to the Moon and Mars. The safety and well-being of the crew critically depends on early detection of threats as well as maintaining stable and acceptable conditions in the crew habitat. Prototype sensor technology being developed on this project addresses both aspects. Carbon monoxide formation is a reliable indicator of evolving fire threats and this gaseous combustion product allows rapid early detection. A highly sensitive carbon monoxide sensor is proposed for early, fast and unfailing fire detection. Current fire detectors are prone to fatigue and have insufficient sensitivity, selectivity and time-response. Smoke detectors cannot detect early stages of combustion and become unreliable if exposed to dust particulates. A second project part addresses habitat air composition monitoring. A multi-species device will be developed to simultaneously monitor oxygen, carbon dioxide and moisture. The optical sensors developed on this project have unique features like fast response, high precision and strong species selectivity. Design criteria such as small footprint, low weight, low power consumption as well as internal calibration and continuous sensor health monitoring will be implemented to provide spaceflight optimized sensors. An absorption approach using modulation techniques implemented on size optimized platforms will be applied.

Primary U.S. Work Locations and Key Partners



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Table of Contents

Project Introduction	1
Primary U.S. Work Locations and Key Partners	1
Organizational Responsibility	1
Project Transitions	2
Project Management	2
Technology Areas	2

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission
Directorate (STMD)

Lead Center / Facility:

Glenn Research Center (GRC)

Responsible Program:

Small Business Innovation
Research/Small Business Tech
Transfer

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Organizations Performing Work	Role	Type	Location
★ Glenn Research Center(GRC)	Lead Organization	NASA Center	Cleveland, Ohio
Vista Photonics, Inc.	Supporting Organization	Industry	Santa Fe, New Mexico

Primary U.S. Work Locations	
New Mexico	Ohio

Project Transitions

**December 2009:** Project Start**June 2011:** Closed out

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX06 Human Health, Life Support, and Habitation Systems
 - └ TX06.4 Environmental Monitoring, Safety, and Emergency Response
 - └ TX06.4.2 Fire: Detection, Suppression, and Recovery